

November 5th, 1994

Mr. William Caton
Acting Secretary
FCC
1919 M Street, NW, Room 222
Washington, DC 20554

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NOV 14 1994

Subject: Ex Parte Filing in PR Docket No. 93-61

Dear Mr. Caton:

FCC MAIL ROOM

Attached are two copies of a set of messages sent on November 5th via the Internet to Chairman Reed Hundt and counsel Ruth Milkman concerning the use of unlicensed radio transmitting devices in the 902-928 MHz band (PR Docket No. 93-61).

Sincerely yours,



David Hughes
6 N 24th Street
Colorado Springs, CO
80904

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FCC MAIL ROOM

Reed Hundt, Chairman
FCC
Washington, DC

Dear Chairman Hundt

I am enclosing below, a series of short online expressions, and responses I have made on the Internet and other places regarding the importance and value of the FCC's preserving unlicensed Part 15 bands for unrestricted, free use by the American public, using FCC approved devices. Which technologies I have followed for years, and only recently have been able to use from a variety of vendors, and show others how to use in grass roots educational, rural community, and low income areas as an extension of, or substitute for costly commercial wired solutions which in many areas are simply out of the question.

So when I learned of your Commission's intention to start chopping up those bands, and auctioning them off, I have expressed, and here express, in the strongest terms, my objections to the extension into unlicensed bands of the auctions for the right of dominant use - and sale to the public as commercial services - by individual bid-winning companies.

I'll let my postings to the comppriv Internet maillist, public dialogue with White House representatives, and reports of how these technologies even now are being used in the REAL public interest speak for themselves.

While I do some telecommunications consulting, and our small company Old Colorado City Communications, provides a local Internet service, and we install some small systems in schools, I am not part of the 'Wireless Industry' in any manner, shape or form. I merely deeply understand the significance, using the latest technologies, what they offer, use it, and advise others where it is the best solution to their needs. Especially among the 83,000 public schools who are having a hell of a time getting students and classrooms wired, cannot afford commercial cellular, and will NOT use commercial spread spectrum wireless. And in rural, remote, and minority-cultural areas far, far off the urban Information Highways. And I have a clear and penetrating insight into what is, in communications terms, in the 'best interest' of huge segments of the American public who are already risk never getting on the Information Highway. 'Trickle Down' telecom is NOT the only good policy.

If the broadest public goal is 'Universal Access' to global telecommunications, I assure you that keeping some bands free for public use is far more in the Public Interest, that selling them all off to Corporate America, who never paid for their creation, and thus 'commercializing' everything. Wireless is the LAST technology of freedom. And I don't want you or your fellow commissioners

selling that off!

I have mailed the required 2 hard copies of this message, and the following e-mail to the FCC Secretariat, as required for matters before the commission.

Dave Hughes
6 N 24th Street
Colorado Springs, CO
80904
dave@oldcolo.com
719-636-2040 voice

copy: Ruth Milkman, Counsel

Posted to the Internet

Wireless Modems - The Last Technology of Freedom?
Dave Hughes
dave@oldcolo.com

I have long believed that advances in wireless digital technologies may transcend what is being accomplished by regulated telephone and cable wired telecommunications. Especially the radical achievements in Spread Spectrum technology are beginning to be turned into practical products. The ability of ever faster processors to sort signal from noise at ever lower power thresholds may have already passed us, as George Gilder argues, into the era of 'unlimited spectrum.'

The battles behind the scene at the FCC since 1981, with large corporations trying to 'buy' licences for big chunks of the spectrum was underscored by the recent unprecedented auctions of frequency bands. Which frequencies, once licenced, will never again be free to use by the public. However there are still bands on the spectrum set aside by the FCC - called FCC Part 15 bands for 'no licence' devices which can imply 'no operational cost' as in phone and cable service. One band is the 902-928 mhz frequencies which a number of companies have jumped into to make advanced devices to use them, where the only cost is the purchase of the device, not the communications through space.

This has great implications for education, for at once it can attack the problem of 'no phone lines' to a classroom. And in many rural and remote places, provides a partial answer to 'distance learning' possibilities.

Companies such as Tetherless Access, Metricom, and Cylink are but a few who are offering great solutions to many telecom problems.

I gave a pair of Metricom's revolutionary small Ricochet

wireless modems the acid test the night they arrived. I put one on a serial port of our Internet service in place of a dialup modem, and walked down the street about 600 feet to Rogers Bar, plugged the other one on battery power into my laptop computer serial port, called up Procomm at 19.2, and commanded ATDT0000-0173 and voila! I was online, wireless, as fast as the serial port on my laptop could operate reliably. If I had high speed ports, the Ricochet could have sustained 77kbs throughput - faster than a 56kb dedicated circuit.

Metricom's development of a family of wireless modems which operate in the no-licence FCC Part 15 902-928 mhz range, using spread spectrum technology is the first real end-user products of their type in the world. While, in Cupertino, California the Ricochet modems are rented by end users to connect to Metricom's cell-like, city-wide 'mesh' of pole-top modems in a flat-rate network service, Metricom also sells the Ricochet modems seperately. For \$495 each.

Ricochet's can 'peer' with each other, as pairs, or in a local 'StarMode' network. They even include PPP protocol. There is no cost for the communications between modems so used individually. This is no digital cellular phone. It is 'free spectrum' local digital radio communications. The Ricochet's are tiny - less than 8 inches long, 2 inches wide, and 3/4 of an inch deep. Half the body is taken up by a 6 hour battery. There is a small 9 volt DC output wall transformer with typical power plug and 6 feet of cord. And you can order them with either a 9 pin PC, or Mac Din serial cable.

Plug and play.

A 4 inch rubber duck antenna lies flush against the case, covering the on-off switch. It pops to various positions. It is removable, but by FCC requirements, the connector is non-standard. There is one green light, which blinks and beeps intelligence about the state of the modem and connections. And each modem has a unique 'address' of the form 0000-OXXX, which is used to connect to each other.

In a brilliant design decision, Ricochets respond to 16 standard AT dialup and 28 S-Register modem commands- which are not only familiar, but can accept standard terminal software. They also autobaud, setting themselves to your terminal speed settings. With their 4 inch omni-directional antenna they have a range of about 1,500 feet. For the FCC limits them to 1 watt of power. But it is technically possible to give them much greater range with Yagi antenna. Some 1 watt spread spectrum have operated over 20 miles line of sight. I am thrilled with my Ricochets.

They are the only telecommunications devices comparable to the empowerment of people by personal computers.

And they are the last technology of freedom.

Dave Hughes

Posted as a Reply to Thomas Kalil, White House who assured me the Administration is 'committed' to unlicensed spectrum for the public

Thomas:

Please stay in this conversation and lets get to a substantive level.

(I wish Bill Frezza would join in with his knowledge of wireless, which is very extensive. He had a bad day. Better to beat on Washington than his dog)

What I fail to understand is how you can say that the Administration supports unlicensed use, when its appointed FCC Chairman leads the move to auction off those very bands which are the *only* ones which I know of that can be used today by devices made by 30-40 companies who have, ever since the 1985 rulings of Part 15, have made devices for wireless lans and other really innovative uses.

First of all, if Commerce was ordered by Congress to turn over 200mhz why did they start with the 'shared' spectrum, instead of those used exclusively by Federal agencies? (The question Gordon asked). And where will the 'new' shared spectrum come from?

Secondly the reasoning given in the FCC statements made at the time of last weeks rulings make no sense at all to me. (I hope to get the full text of the article Gordon refers to on line here.)

Hundt talks about doing this so the 'marketplace' can decide who uses the spectrum. IT ALREADY IS! They are called Cylink, Metricom, Tetherless Access and all the OTHER companies who are giving me choices of whose devices to buy to use the 'unlicensed' spectrum. Giving exclusive licences to ONE company seems to me to be the height of anti-competitiveness!

He also talks about what a great move this is because it will 'create' jobs. As if it isn't now, with all the companies researching, designing, producing, and marketting their wireless systems. In fact, I'll assert here and now, that if, in the spectra where wireless technologies can be used with substantially no interference by others using the same bands (the George Gilder argument, which in essence is 'given the processing power of chips at extracting signal from noise at ever lower power levels, we are moving into the era of unlimited spectrum'), so long as the transmissions are no licence and free, why won't that create a hell of a lot MORE jobs - not just in the companies making the things, but in users whose cost of communications just dropped to zero?

Then in the rulings themselves which let those who are licenced to use the spectrum to 'shut down' anyone not licenced who 'interferes.' How the hell is something like that going to be administered?

So I gotta agree with Bill Frezza at least to the degree that he, and I, sense an awful lot of buzz-words and politically correct

sound bytes in the statements accompanying the Oct 15th FCC rulings which just don't track with what I know (admittedly limited, but targetted right to the technological-policy-economic core of the matter) and even more so with what you say. Very, very contradictory.

What is my interest? Not theoretical or ideological. Among other things, I try to find, and implement, solutions to the costs for remote and rural, no-available-phone, too-costly-networks (places where even a 56kb connection is out of the question). And practical and affordable solutions to the nation-wide chronic problem of 83,000 public schools in the US who face huge costs in re-wiring, or paying stiff installation charges to telcos to extend lines to classrooms which were never wired in the first place. Or setting up lanable networks where lan administration becomes a whole new task, requiring the hiring of more people just to do that.

I find short range (1,200 feet to 20 miles) spread spectrum, no licence, no operating cost, wireless modems an affordable, adequately-secure, high-enough-performance, intelligent amateur-administratable solution to a LOT of these problems. And in fact right now am assembling a system for a rural school of 700 students, for under \$10,000 which will give whole classrooms (its designed to be wireless-mobile) of 16 or more computers full access to the Internet, each other, by nighttime modem-dial up to existing phone lines in another building, and avoiding several thousand dollars in one-room (no mobile) telephone installations, AND the running RBOC costs for them year round. Multiply that savings by 83,000...

And if commercial wireless was such a great deal, why hasn't everyone, including schools, flocked to Ardis in about 8,000 cities, or RamMobile? I see NO schools using them to solve their data needs.

Oh yeah, prices will 'fall' as volume goes up. But in Part 15, the price is already zero! Why is the Federal government *forcing* the consumer to pay? Who is it representing anyway? I mean 'privatization' of telecom is one thing. But COMMERCIALIZING it where it is not, and only in the interest of a handful of giant companies (who can afford to bid) is quite another!

So Thomas, what's the story? I am thoroughly confused.

Dave Hughes
0000-0436 77kb Ricochet Wireless

Posted to compriv mailist a few days later

This last weekend my little two Ricochet, Metricom wireless modems saved the day in an 8 person conference in the Marriot Hotel in Chicago where everyone (4 from IBM) flew in to discuss for 4 hours, and decide the moving of a telecom service from California to Chicago. Half had never seen what we had to offer, the other half

had not seen the existing system. We needed all to be looking at it on a big screen.

There was no phone in the executive conference room. We all had laptops, a big screen, an LCD panel, and modems. But no outside connection.

So I went to my room, connected up one wireless modem by a null modem cable to a 28.8 phone modem to the hotel room telephone by RJ-11. Then pulled out my other wireless modem in the conference room in another part of the hotel, plugged it into my laptop, the laptop to the LCD and overhead projector. Then, at 9,600 baud spread spectrum, connected to my room, the modem, and dialed locally the X.25 pad in Chicago (\$.85 call) and logged onto the California service. And other services.

Worked perfectly. For two wireless, battery powered hours. The conference focused on the reality of the two networks to which we were connected, wireless, not talking heads or static foils. The temporary, wireless, speedy connection made the day work. A day which cost over \$5,000 in travel costs, and ??? in salary costs.

Now had the Federal Express delivery guy with Hotel Security burst in the room while they were trying to use the same frequencies - which Fed Ex 'licensed' - and said "Sorry dudes. I'm shutting you down. We own the frequencies here in Chicago. The FCC says so..."

Then the results of my visit to poor, Hispanic, Center, Colorado school district on November 2d,3d, 1994, posted in many places

Wireless and American Dreams

The FCC auctions, and the assumptions behind it, were very *much* on my mind when, yesterday in tiny snowy Center, Colorado's school building, I gave my pair of Metricom Wireless Ricochet modems a couple of real-world tests.

I had set up the HiCom system the district bought from us (OS2 486, Lora BBS, TCP/IP, our code) in a classroom without phone lines, where 'Special Ed' teacher Jim and one-armed Valley native Elementary Teacher Jim tried to absorb all that I had to show them to operate the system. Already named 'Center Online.'

In order to test the ports, demonstrate potential, and maybe make a little history, I accessed the BBS the first time once it was up, from across the room, wireless, for the first new-user login.

Then, as young special education students passed by the machine, overwhelmingly Hispanic (80% of the school/community is Hispanic, and almost the same percentage eligible for school lunches such is the poverty in that part of the valley) I grabbed one bright eyed little boy - Valentin Villasenor - and invited him to log-in as the first 'student' to do so. He did, slowly but surely, only taking a long time figuring out what secret 'password' to enter. (we raised the time-out for login from 10 to 15 minutes after watching him look, ponder, think and then try). And he entered a message, in

lower case English, to his teacher asking if he could go to lunch now. Dennis answered yes by replying to his message. Which he then got by subsequent login. The first BBS 'exchange' in Center.

So as we all, some teachers, and a whole large roomful of little students ate lunch, I asked where the 'closest' telephone was to the Special Ed room where the early development of the BBS (menus, sections, look and feel, Spanish and English) will take place. Turns out to be in the kitchen itself.

So, after configuring the TCP/IP Slip capabilities of the system, I put one of the wireless modems on COM1 of the 4 ports on Center Online, and we went down to the kitchen where the washing machines were roaring, the staff was cleaning up after feeding some 600+ students, K-12. And after politely asking permission of the lady who operates the food service with an firm hand, if we could use her phone for a test, we hooked up a Supra 28.8 modem to the wall plug which had, a little home-made (installed) supplemental RJ-11 outlet by the phone jack. Then with a modem cable with a 9 pin gender bender to connect the two 9 pin female plugs to each other at the Wireless modem end, and a null adapter to connect the other end to the phone modem, we turned them both on and went back to the Special Ed room to connect.

In less time than it takes to write about it, we had run the SLIPTERM, connected to the remote wireless modem, told the phone modem to dial the local-dial number of Colorado Supernet's terminal ports in Alamosa, 40 miles away, I logged on with my own Slip account, and we were up on the Internet!

All the pieces worked, and would work, so that the remote, rural, poor-area, Center school, would soon be up fully on the Internet at a monthly cost of about \$300 a month, 24 hours a day, bidirectional.

Then the wireless modem showed yet *another* possibility that had not occurred to me when I first got there.

The school will gladly bring two new phone lines to the room where the system is. One for 24 hours SLIP connection to the Internet, (which our experience shows can be used by at least 8 people simultaneously who are logged into the BBS by lan, serial line, or modem dial in). The other will be for 'community' access, including students and teachers at home. But only one line.

BUT, as it turns out, there are at least 8 other administrative, kitchen, teacher lounge, etc phones in the school buildings within Richochet modem range of BBS-Server. None of which are in use after about 4PM week days, nights, weekends, and all summer and vacation times. What if, I asked Superintendent, Gary Kidd, (who is *really* committed to improving this desperately backwater school with technology) he bought through us, several 'pairs' of Richochet modems (currently at \$1000 a pair, but hopefully at lower cost) and with one 14.4 modem (maybe \$125) per pair, and connected all of those existing phones, wireless, to 2,4,6,8 - whatever - terminal ports on Center Online.

So that, with only two 'dedicated' new phone lines for the BBS, only one of which is for outside modem dialin, they get, late afternoons, nights, weekends, up to 8 OTHER incoming access lines at NO additional monthly telephone cost - so that as many teachers and students as possible can log in - and, as needed, go out to the full Internet, from outside the school. Using loaner laptops where

necessary, or from one or more in the tiny 'community' library, OR, tiny city hall, or other public places. Or from the community Catholic, and/or Baptist, or Methodist churches who admirably serve the community now. (and who are being taught by Noel Dunne, of La Cocina, how to 'go online')

Or, if I can get a pole-top antenna that can cover the small town which is no more than a half mile across, by loaner wireless for some of the kids with no phones at home. *Lots* of the students have no phones at home. When young Valentin logged onto Center Online the first time, the registration software asked him for his 'home phone number' he looked at me and said "We don't have a phone." So we had him enter the school's phone number - the only telecommunications link with the outside world he is likely to have for a long time, perhaps all through school years. Unless he can use no-comm-cost wireless.

And then Valentin can do his homework, access the world, communicate with other kids and, above all, let them read and write in English - which is the crying requirement now. As 40% of the school's 700 kids either can speak, read, write ONLY in Spanish, or have such limited English skills, that the school district came under court order to do a better job in getting kids in those categories up to general educational speed in the dominant language of the country. (But they can't find, or attract enough bi-lingual teachers!)

Reading-writing online may be *the* most dramatic thing they can do to improve things!

So in *innumerable* ways, no-licence, no-comm-cost wireless can/will go to the HEART of Center's problem of education, both economically and pedagogically, of community learning/teaching, economic development, and social outreach, (you cannot *beleive* just how socially isolated those kids are. As I listened to stories by one white school board woman member who, when sitting with some of the 14-15 year old Hispanic girls, they asked her when did she have her first baby. When she told them she was 30, they exploded in disbelief, one girl saying "you were old! You must have been past menopause. NOBODY has kids that old!")

Because those girls are pregnant at 14-16, many deliberately so to get welfare checks so their family can eat. They know so little of what goes on elsewhere. And many simply have already lost any dream, or vision, of going anywhere, except 'the valley.' From which few, including boys, leave. And instead drop out. Of 40 who were tracked from 9th grade, 17 graduated. And two of them, girls, were pregnant. And the girls - even the brightest ones - indignantly ask "Why should we waste time here in school when we could be making \$5 an hour in the lettuce fields?"

They may be already lost. But those tiny tots with black eyes and brown skins that marched past me in the lunch room, are not. And they, like Valentin Villaseñor, can go online before their dreams are crushed, or empty of possibilities because they simply have no concept of what is possible to them that they learn through technologies that can link them to the rest of the world.

Even if they have to be taught by white teacher, co-Sysop Jim who has to operate the computer with one hand, and the claw that is his other arm. (life is tough in the valley and can be dangerous on the farms), and who doesn't handle Spanish that well as he walks

into the Elementary computer room, equipped with 22 Apple II's, networked, where even MECC can't provide enough relevant software by disk. But the kids will be reading/writing. In English - as each line on the Menu contains both languages. 'Center School - Escuela - Online'

Yep. Center is where the NII is at, for me. Solve their problems, or even make serious inroads with telecom that is affordable and accessible - which just two days in the Valley showed me can be done with public-spectrum wireless as an extension to the slim POTS phone 'infrastructure' and the stated Administration policy of 'Universal Access' can become an American Reality.

But wait for high-end, fiber-optic, cable, Mosaic, or commercial-service wireless 'trickle down' and we will NOT achieve that social goal which everybody mouths, but few seem to practically support. ('Let em eat ASCII.')

Yeah, even with spread spectrum Part 15 wireless, it will be a long ways to answer that girl's question "What has all this got to do with the lettuce fields?"

But I am already past the issue of access. With wireless. So all of us can tackle the really *tougher* question in Center terms, of how to turn those kids skepticism into dreams, their fun connecting into language skills, their latent talents into accelerated development, and for some - outright careers from the Valley.

It was cold as hell and snowing and foggy when I went over deserted Poncha Pass at night on the 180 mile drive home from the San Luis Valley. Listening to how another mother named Smith who lost it, tried to solve *her* problems.

So I ask again. What the hell is Reed Hundt's email address? I got a little kid named Valentin, and a school Superintendant named Kidd in Center, Colorado, who have some questions to ask him about an auction.

But Hundt had better brush up on his Spanish, before answering young Valentin. And have some pretty damned good answers for Kidd as to why he should be forced to buy the wireless access he now has free.

When I called Superintendent Kidd today at 2 PM to get the correct spelling of young Valentin's name, he called me back and said "Guess what? When I went into the Special Ed room to get his name from Dennis, there was Valentin sitting at the computer working away by himself even though we released all the kids at noon today. They couldn't tear him away from it!"

So the only type of school 'reform' that makes sense to me is already happening in Center, with Valentin Villasenor. Who doesn't have a phone, but can sure use a wireless modem, that, once bought - like a computer - can last for years, maybe decades. And which can cost, mass produced, like \$100 each.. But ONLY if he, his parents, or the school, do NOT have to pay - like cellular, like Ardis, like Ram Mobile Data - endlessly on a per minute basis, use of the 'free' spectrum - locally- which some megacorporation has 'licenced' from the Federal government even though it 'cost' nobody one red federal cent.

So the issue before the FCC is whether or not it will, in these matters of unlicenced spectrum primarily represent the interests of the spectrum using Public, or only those of Corporate

communications America. They are not, believe it or not, the same.

Dave Hughes
Cursor Cowboy